

Effects of dietary humic acid on growth performance, haemato-immunological and physiological responses and resistance of Rainbow trout, *Oncorhynchus mykiss* to *Yersinia ruckeri*

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This study investigated the effects of dietary humic acid sodium salt on growth performance, haemato-immunological and physiological responses, and resistance of rainbow trout, *Oncorhynchus mykiss* to *Yersinia ruckeri*. The experimental fish were divided into four groups; three of them were fed with humic acid incorporated diets (0.3% H3, 0.6% H6, 1.2% H12) and an additive free basal diet served as the control. Growth performance and haematological parameters of rainbow trout were not affected by humic acid supplemented diets ($p > 0.05$). However, dietary humic acid especially with 0.6% incorporation significantly increased stomach pepsin, intestinal trypsin and lipase activities $p < 0.05$. Following 60 days of feeding trial, fish were challenged with *Yersinia ruckeri* for 20 days. At the end of the challenge period, significantly higher ($p < 0.05$) survival rates were found in the 6% humic acid group compared to all other experimental treatment. Thus humic acid might replace antibiotics in diets for rainbow trout to control yersiniosis.